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WORLD HEALTH ORGANIZATION

In this issue

- *Participants in a seminar at Krakow report an increase in gonorrhoea in various parts of the world. Reasons put forward are growing resistance of the gonococcus to penicillin, promiscuous sexual behaviour (particularly among teenagers and, in some countries, immigrants), and indifference to the consequences of infection. Salpingitis still occurs in not less than 10% of infected women—so many of whom are undiagnosed cases—and causes 2-3% of all cases of sterility (see page 289).*

There is now in the Congo (Leopoldville) a skeleton health staff rendering very useful and, in some cases, life-saving services. Of the 130 doctors urgently required 118 have been recruited, and 90 are now working in the Congo side by side with others provided by the International Committee of the Red Cross and the League of Red Cross Societies. Another 90-100 health staff will be needed almost immediately, but, says Dr M. G. Candau, Director-General of WHO, their recruitment depends on the availability of UN funds (see page 307).

- *As little as four years ago, a joint FAO/WHO Expert Committee considered immunization of human beings with living* Brucella *organisms to be still in the experimental stage and not to be generally recommended. Since then, considerable progress has been made, and the live vaccine has been used on a wide scale against brucellosis in the USSR (see page 294).*

- *Vaccination programmes, it is widely hoped, will ultimately become the people's programmes with government participation rather than government programmes with the people's participation. When they do, vaccination will presumably be voluntary everywhere ; but at present compulsory vaccination is still essential in many areas (see page 297).*

- *By the end of 1960 approximately 309 million persons had been tuberculin tested and 117 million vaccinated, in the course of WHO/UNICEF BCG vaccination programmes covering 41 countries and territories with a combined population of over 800 million (see page 300).*

GONORRHOEA TODAY

The hopes aroused in the nineteen-thirties by the introduction of the sulfonamides for the treatment of gonorrhoea were subsequently disappointed because of increasing drug resistance on the part of the gonococcus. The advent of penicillin at the end of the Second World War gave new hope for the control of the disease. However, despite initial success particularly in Europe and America (in Canada the incidence of the disease fell by 57% between 1946 and 1956), such control has not been achieved and the reservoir of the disease was never reduced by penicillin to the same extent as in syphilis. The initial decline became a steady state and now the curve has been reversed in many countries. In others the infection has never come under control at all; endemic areas and areas of increasing incidence continue to be found in many parts of Africa and Asia.

In 1959 a WHO Expert Committee [1] reported that the disease was on the increase in 15 of 22 countries studied and that "gonorrhoea is widespread, remains uncontrolled and is one of the most challenging health problems in many parts of the world". The disease remains common and is spreading in some areas, particularly among young persons. Moreover, the actual incidence is higher than the reported figures indicate because of failure to notify every case. In the USA the total number of cases is perhaps 5-10 times the official return; but, even on the basis of the official figures alone, gonorrhoea was in 1959 the third most common infectious disease, exceeded only by measles and streptococcal infections,[2] syphilis being fourth.

Similar increases are reported from many countries and this trend was amply confirmed from a number of sources at a European Symposium on Gonorrhoea, organized by the Polish Ministry of Health and the International Union against Venereal Diseases and Treponematoses, which met at Krakow, Poland, in 1960.[3] While it is true that many of the classical complications of the disease, such as arthritis and iritis, have now become rarities, salpingitis still occurs in no less than 10% of infected women and causes 2-3% of all cases of sterility.[4]

That this should be so despite technical progress and initial success shows how recalcitrant the problems of communicable disease control can be. Only from careful study of the reasons for this setback can new measures emerge to deal with the present situation. In a recent issue of the WHO Bulletin [5] a number of experts assess the reasons for the present failure to control gonorrhoea on a large scale. Some proposals for the future are also made. Reasons for the failure of control include difficulties in defining the reservoir of infection, difficulties in diagnosis, and increasing difficulties in therapy.

Factors responsible for recrudescence

Epidemiological factors

Gonorrhoea has a relatively short incubation period. Symptoms are usually apparent a few days after exposure. This means that even the most efficient treatment of the individual case may not prevent spread of infection before further sexual contacts have been located. This is in contrast to syphilis with its longer incubation period during which the contacts can be found (accounting, in part, for the greater success in its control). Further, gonorrhoea is a much more common disease than syphilis. The probability of infection is greater, any immunity is short-lived, repeated attacks and

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **190**.

[2] Guthe, T. (1961) *Bull. Wld Hlth Org.*, **24**, 297.

[3] Unpublished working document WHO/VDT/265.

[4] Gisslén, H., Hellgren, L. & Starck, V. (1961) *Bull. Wld Hlth Org.*, **24**, 367.

[5] *Bull. Wld Hlth Org.*, 1961, **24**, 293-398.

reinfections occur. Both parties to an infection are not treated simultaneously often enough and certainly not as often as in syphilis. These and other epidemiological peculiarities of the disease must be taken into consideration in planning future campaigns.

Waning interest

One of the outcomes of the early success of penicillin therapy was a feeling, widespread among patients and extending to some doctors, that gonorrhoea had now become a minor infection of little consequence, curable by a single injection. On the part of both patients and doctors standards of responsibility with regard to notification, treatment and the search for contacts declined. This is in analogy with the effect of the use of antibiotics on standards of care in dealing with hospital staphylococcal infections, and has had the same adverse consequences.

Sexual behaviour

There is some evidence suggesting that promiscuous sexual behaviour in young persons is an important factor in the spread of gonorrhoea today. The periodically examined prostitute has given place, in many parts of the world, to the " good-time girl ", the enthusiastic amateur who is often a potent source of infection. Teen-age promiscuity has become prevalent in many communities and some prison studies show that more than half of the infected prostitutes are girls under 20 years of age. Hitch-hikers and lorry-girls function as " vectors " for the disease from ports to the interior; and several investigators are convinced of the increasing importance of male homosexuality in spreading infection. Another important factor is population movement. In the case of large-scale immigration, as from the West Indies into the United Kingdom, a new community is formed with a strong preponderance of males whose sexual relations are limited in many cases to a small number of prostitutes.[6] Within any one country similar results follow large shifts of population to industrial centres; a large proportion of infection in any large town is contributed by men and women from other districts. In seaports the effects of promiscuity in transients, and also of homosexuality, are most marked.

Failure of diagnosis

As between men and women. The reported attack rate is usually in the proportion of from 2:1 to 4:1 as between men and women. This cannot be accounted for by a greater degree of promiscuity in men. It suggests, at least in part, a large undiagnosed latent reservoir of infection in women. An infected man with conspicuous symptoms usually reports for treatment; many women do not, or do not know they are infected, so that the disease lingers on unnoticed and undiagnosed. The importance of this lies in the high risk of reinfection run by an adequately treated man who returns to his customary sexual contacts. To improve case finding, efficient epidemiological contact studies are needed on a much wider scale than at present. Even in countries such as Denmark where there are extensive legal powers to trace sources of infection, the problem remains serious.[7]

In female infants and young girls. Although vulvovaginitis in children under 12 is now uncommon in Western Europe, it is still frequently reported from Poland[8]—where it is separately notifiable. The infection may involve the urethra, cervix and rectum. It is difficult to diagnose and often resistant to both penicillin and streptomycin.

Through faulty laboratory technique. This is allied to the preceding point about the undiagnosed female case, since ordinary laboratory methods often fail to provide a definitive diagnosis. Culture is usually regarded as the best method, but sometimes less than half of the cases are discovered by culture despite improvements in technique by the use of special media and of the oxidase test. Where immediate inoculation of media and growth of specimens are not possible,

[6] King, A. J. & Nicol, C. S. (1961) *Bull. Wld Hlth Org.*, **24**, 373.

[7] Perdrup, A. (1960) *Gonorrhoea in Denmark* (unpublished working document WHO/VDT/281).

[8] Michalowski, B. (1960) *Difficulties of diagnosis in treatment of gonorrhoea in girls of 0-14 years* (unpublished working document WHO/VDT/274).

the results after transportation to the laboratory are often poor. The gonococcus is sensitive and capricious in its behaviour; even the use of wooden instead of aluminium spatulae in transferring material may prejudice the result. Serologically, the complement-fixation test has proved unreliable and it is not widely used; in some centres the clinical findings are mainly relied on for diagnosis and assessment of cure. It is clear that better laboratory methods for obtaining rapid, early and convincing diagnosis are required.

Misdiagnosis. The situation is further complicated because non-gonococcal urethritis or vaginitis in many cases either coexist with gonorrhoea or are mistaken for gonorrhoea. Very little is known about these infections, but culture often demonstrates the presence of *Trichomonas vaginalis* or of *Candida albicans*. Some infections can be shown to be of viral origin, but the etiology of many genito-urinary infections remains obscure. Much microbiological research is needed before they can be properly defined and treated; how essential this is is indicated by the finding of non-gonococcal infections in no less than 25% of men examined at one gonorrhoea clinic.[9] Since the response of these infections to antibiotics may differ, a great deal of confusion may result.

Failure of treatment

Many factors must be considered if confusion is to be avoided. It is desirable to distinguish between relapse and true reinfection. Failure to do so will give an unduly pessimistic picture of the results of penicillin therapy. Probably most of the so-called "resistant cases" are reinfections. But true failures do also exist. Penicillin may be given in too small a dosage or for too short a time, or both, particularly if the convenient oral route is substituted for injections; and, if an effective penicillinaemia is not maintained, phagocytized but living gonococci can survive and produce relapse. Even with an adequate concentration of antibiotic in the blood over a reasonable period, there is still the difficulty of ensuring that enough of it reaches the localized genital pockets of infection; this is particularly so in women who may require higher dosages than men. Other host variables which may vitiate treatment include unusually high rates of renal penicillin excretion; the production of tissue penicillinases or antibodies; and, possibly, the effects of alcoholic or sexual excesses.

Penicillin resistance

Not until all these factors have been considered and diagnosis has been confirmed by culture, the maintenance of effective blood concentrations of penicillin checked, and reinfection excluded, can the existence of true penicillin-resistant organisms be postulated as responsible for the failure of treatment. Even then, there must be confirmation from *in vitro* studies. Much has recently been written on this subject, and resistance has been credited with most of the responsibility for the recrudescence of gonorrhoea. There is little doubt that a moderate decrease of penicillin sensitivity in some strains of gonococci is a real and increasing problem. But the situation remains indefinite because most reports are not well enough substantiated and because there is no generally accepted standard method for measuring sensitivity. Failure to cure with adequate doses of penicillin does not, in itself, imply that the microorganism is resistant: the *in vivo* results must be correlated with *in vitro* studies. Unfortunately, the methods used and the inhibitory concentrations of penicillin adopted in making such studies are at present far from uniform. "It is impossible to compare gonococcal sensitivity determined by one author with that found by others. This is due to the lack of a common method for performing sensitivity testing."[10] The importance of this cannot be overstated, for if sensitivity to penicillin is really declining we should—bearing in mind experience with the sulfonamides—look to curative agents other than penicillin. This would be unsatisfactory

[9] Khalfat, A. (1960) *Urethro-genital genococcal suppurations observed during the past three years in the Charles Nicolle Hospital, Tunis* (unpublished working document WHO/VDT/276).

[10] Thayer, J. D. et al. (1961) *Bull. Wld Hlth Org.*, **24**, 327.

since penicillin, by virtue of its low cost and certainty of administration by injection, together with its relative lack of toxicity, remains the drug of choice.

Some definition of the term "resistance" is necessary. It is usually defined in terms of an arbitrarily fixed concentration of the antibiotic concerned; an organism inhibited by this concentration or less is said to be sensitive or, if not, "resistant." But this is relative resistance, varying from one laboratory to another, and can be overcome *in vitro* by raising the drug concentration. It might be better to think in terms of absolute resistance, where the organism can be inhibited only by concentrations of antibiotic that cannot be achieved or maintained in the body. It is clear that no agreement on the extent of resistance can be expected while there is no internationally recognized standard for measuring the phenomenon. The number of resistant strains, expressed as a percentage of all strains, does not appear to be increasing; different workers report it as from 10% to 25%. However, resistant strains do not appear to regain their sensitivity on continued culture. Further, a comparison of present-day strains with strains preserved from 1944 reveals the emergence in "stepwise" fashion of a small group of highly resistant strains, which suggests a recent more rapid, and possibly mutational, trend in the evolution of penicillin resistance.[11] Some of these strains require for their complete inhibition a concentration of penicillin 20 times as great as was required for the most resistant strains from 1944. There is a close correlation between *in vitro* and *in vivo* resistance and it is the resistant organisms which are mainly responsible for the failure of treatment. The relapse rate is 5 times greater in patients with resistant strains.

Resistance to other drugs

The appearance of penicillin resistance naturally directed attention towards sensitivity to other antibiotics, of which streptomycin is the only one in common use. Some 23.5% of strains are uninhibited by a concentration of 50 μg/ml of streptomycin and may be regarded as resistant; but above 1000 μg/ml a resistant organism cannot be inhibited however large the dose employed, i.e., in practice this is an all-or-none phenomenon: there is either complete sensitivity or complete resistance, and there is a very close correlation between *in vitro* resistance and clinical failure rate. Resistant strains are increasing and it may be predicted from the laboratory data that the wide-scale use of streptomycin would eventually lead to all strains becoming resistant. Clinical experience in France bears this out.[12] Penicillin has not been widely used in France in gonorrhoea for fear of masking a possible concomitantly acquired syphilis, and in 1954 the Ministry of Health recommended the use of streptomycin. The standard treatment dose has been 2 g of dihydrostreptomycin but currently nearly a quarter of all strains require for laboratory inhibition a concentration unattainable in man, and the clinical failure rate in 1958 was 13.6%. Since then it has been necessary to supplement treatment with penicillin or sulfathiazone; so far, most streptomycin-resistant gonococci have remained sensitive to adequate doses of penicillin.

Thayer et al.[13] have studied the effects on both penicillin-resistant and penicillin-sensitive strains of a number of other antibiotics: kanamycin, leucomycin, chloramphenicol, dextrosulphenidol, oxytetracycline, chlortetracycline, tetracycline, dimethylchlortetracycline and synnematin B. In general, gonococci are sensitive to these agents irrespective of their degree of penicillin sensitivity, though this does not apply to synnematin B, a penicillin derivative. There is, however, some evidence of increasing tetracycline resistance and for this and other reasons the tetracyclines are not to be recommended for routine treatment. Spiramycin, erythromycin and polymyxin are at present practically 100% effective; but they are very expensive and in any case should be kept as a "strategic reserve".

[11] Reyn, A. & Bentzon, M. W. (1961) *Bull. Wld Hlth Org.* **24**, 333.

[12] Durel, P., Roiron, V. & Delouche, L. (1961) *Bull. Wld Hlth Org.*, **24**, 343.

[13] Thayer, J. D. et al. (1961) *Bull. Wld Hlth Org.*, **24**, 327.

It is interesting to note that acquired resistance of gonococci to the sulfonamides, which had become almost complete by 1946-48, has largely disappeared since their use in gonorrhoea was abandoned. Only some 5-10% of strains of gonococci are not inhibited by a concentration of 50 μg/ml of sulfathiazole, which means that the drug is once more nearly 100% effective and may be used as a supplementary weapon in treatment. Its disadvantages are that, as it is taken orally, dosage is unreliable, side effects are common, and inevitably any large-scale use will lead to a return of resistance.

Future possibilities

Any improvement in the management of gonorrhoea must come, first, from a more thorough application of existing methods of control, particularly epidemiological case-finding, and from the introduction of new techniques. Both the WHO Expert Committee of 1959 and the Krakow Symposium in 1960 emphasized that penicillin must remain the sheet anchor of treatment and that resistance should be met by using larger doses than the original standard of 300 000 units. A mixture of a short-acting form, to produce effective penicillinaemia rapidly, with a more slowly acting compound, to maintain this level, should ensure that gonococci are destroyed even after phagocytosis and so prevent relapse. A total dosage of 1.8 mega-units is recommended, given as 1.2 mega-units of procaine penicillin on the first day and 0.6 mega-units of penicillin aluminium monostearate (PAM) or benzathine penicillin on the second day. Some workers have suggested much larger doses still; the dangers of penicillin reactions remain and resuscitation facilities should be at hand. The supplementing of penicillin therapy with sulfonamides is unlikely to yield more than temporary benefit and would probably make sulfonamide resistance reappear before long. The use of other antibiotics is probably undesirable at present, except when infection does not respond even to large doses of penicillin. Resistance to streptomycin, the only commonly employed alternative, is growing. The newer antibiotics should not be used indiscriminately and injudiciously but kept in reserve.

It is important to improve the recognition and treatment of non-gonococcal genito-urinary infections; the discovery of the effectiveness of metromidazole for *Trichomonas* infestation offers great promise for the control of this frequent condition in the male and female alike.

Various advances are being made in the pathological field. The results of swab cultures to be transported to the laboratory have been much improved by the use of Stuart's reducing thioglycollate medium; and the oxidase technique for identifying gonococci in smears and cultures has proved its value. In the recent WHO Bulletin devoted to gonorrhoea Deacon describes the fluorescent antibody technique in which fluorescein-labelled antiserum is used to define the capsular antigens of the gonococcus; [14] this may prove helpful as a definitive diagnosis may now be made within 16-24 hours compared with up to 10 days by available culture methods. This new technique has also yielded positive results with cultures obtained from women that would otherwise have been reported negative. There is thus some hope that it may be helpful in the solution of the epidemiological problems involved in defining the latent reservoir of infection in women and in the rapid spread of the disease before diagnosis can be made. Of great potential value, but still at an early stage, is the work of Tauber and Russell,[15] also described in the Bulletin, on the identification of the gonococcal endotoxin, thought to be a lipopolysaccharide. This work may lead to the discovery of efficient serodiagnostic tests and even, possibly, to methods of immunization. In the meantime, however, the most valuable help from the pathologists would be agreement on a standard for measuring penicillin resistance. It is noteworthy in this connexion that in 1958 the first WHO Venereal Disease Control Seminar in the Western Pacific Region recommended setting up an International Gonococcus Reference Laboratory.

[14] Deacon, W. E. (1961) *Bull. Wld Hlth Org.*, **24**, 349.

[15] Tauber, H. & Russell, H. (1961) *Bull. Wld Hlth Org.*, **24**, 385.

New epidemiological techniques include the so-called " speed zone " and " cluster " techniques, which aim at reaching both sexual and social contacts with the minimum of delay. These methods may not be applicable in all types of society. There is also the possibility of mass treatment for relatively small and separate communities where the disease is highly prevalent. From the sociological aspect some reduction in the incidence of gonorrhoea may be expected from an extension of social work and legislation in cities in so far as these touch on sexual behaviour in young people and on prostitution.

PROGRESS IN IMMUNIZATION

It seems almost incredible today that only a few years ago poliomyelitis could not be combated by any form of immunization procedure. Nor is poliomyelitis the only disease with this distinction. A new WHO publication [1] furnishes other examples of diseases against which no acceptable immunization procedure was known a few years ago but in which the situation is now completely changed.

Brucellosis is an example of such a disease. A Joint FAO/WHO Expert Committee that met in 1957 dismissed as unsatisfactory the use of killed vaccine against this disease, and could not " at the present time, recommend the routine immunization of human beings with living *Brucella* organisms, as it regards the procedure as being still in the experimental stage ".[2] In the new WHO publication Zhdanov describes the large-scale use of live vaccine against brucellosis in the USSR. The vaccine (he states) is harmless in itself and confers a high degree of immunity on the population, and by its use a considerable reduction, and sometimes the almost complete eradication, of human brucellosis has been achieved in many livestock-rearing areas—even before eradication could be achieved in the livestock itself.

Arthropod-borne diseases like tick-borne encephalitis and tularaemia have probably existed in their natural foci for millions of years and certainly long before the appearance of man, the reservoir of the infection being in wild animals. Human infection has been the result of the entry of human beings into such areas of the world as the western parts of North America or the taiga and far eastern parts of Siberia. Man becomes infected when he enters the natural focus of the disease, is bitten by carrier ticks or other arthropods, or drinks the milk of infected goats. In the USSR, according to Zhdanov, a detailed study showed that eradication of the disease or diseases by spraying with insecticides was possible only around inhabited areas. Effective protection is obtainable with special overalls and repellents. But since the diseases do not depend on man, their eradication over the vast areas of Siberia is out of the question. Hence the value of immunization of those persons who are likely to come into contact with the carrier arthropods—lumberjacks, geologists, workers on new construction sites, etc. Russian sources report a 12- to 40-fold reduction in the incidence of tick-borne encephalitis in exposed groups inoculated with mouse-brain live vaccine. This vaccine, according to a Joint FAO/WHO Expert Committee on Zoonoses, has in some instances caused severe reactions, and further research is in progress, particularly into a vaccine grown in tissue culture.[3] As regards the other encephalitides, excellent results have been obtained in horses in the USA by annual vaccination with formalized chick embryo vaccines against Eastern and Western equine encephalitis.

[1] World Health Organization (1961) *The role of immunization in communicable diesase control*, Geneva (*Public Health Papers*, No. 8). The contents include: *Immunization in communicable disease control*, by Professor V. M. Zhdanov; *The background to immunization*, by Professor R. Cruickshank; *The efficacy of immunization procedures used in public health practice*, by Professor G. Edsall; and *Compulsory or voluntary vaccination*, by Dr J. de Moerloose.

[2] *Wld Hlth Org. techn. Rep. Ser.*, 1958, **148**, 10.

[3] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **169**, 43.

Tularaemia, a common zoonosis in the northern hemisphere, affects various wild animals and occasionally domestic animals, especially sheep, in which it may cause epizootics. It may be transmitted to man by contact with infected animals, the handling of rabbit carcases, bites by ticks, the inhalation of infected dust, or the contamination of water by diseased rodents. The usual method of control of the disease in man has been the use of protective gloves, adequate cooking, animal control, etc. But a live vaccine has been developed against the disease in the USSR, which, according to Zhdanov, confers on those inoculated a high degree of immunity, comparable with, if not surpassing, the immunity conferred by smallpox vaccination. As a result, the number of cases in the USSR, which was as high as 100 000 per annum in the middle nineteen-forties, has now been reduced to a few hundred. Edsall mentions the striking effectiveness of a modification of the Russian attenuated vaccine strain in protecting volunteers against airborne infection.

A purified anthrax vaccine has been developed in the USA and tested in an outbreak in which both vaccinated and unvaccinated random controls were exposed. Among the 150 controls there were 4 cases, among the 150 vaccinated none. These results, though perhaps showing slight promise, cannot be considered by any means as conclusive evidence of the value of the vaccine.

In the prevention of leptospirosis, rodent control, disinfection, and protective clothing all play a part. Vaccination has been practised in various countries, Italy, Spain, Japan, and the USSR, but—as the Joint FAO/WHO Expert Committee on Zoonoses pointed out [4] —the numbers of persons under observation have been insufficient to give statistical significance to the differences between vaccinated and unvaccinated groups, and in addition some vaccines have caused undesirable side reactions and been abandoned. Edsall reports several successful trials of vaccines in Italy and the USSR.

Other diseases in which vaccination has begun to play a part or shows promise of doing so include Q-fever, Rocky Mountain spotted fever, and trachoma. Edsall reports studies of an apparently successful vaccine against Q-fever used in the USA and the USSR. One study states that it is effective at least 11 months after administration. A chick-embryo yolk sac vaccine of the Cox type is used locally in the west of the USA against Rocky Mountain spotted fever, and although no statistical studies of its effectiveness appear to exist reports say consistently that it is highly effective. Reports also speak of a vaccine against trachoma which is promising when used on monkeys.

Vaccines are thus being developed against a constantly increasing number of diseases, and it may reasonably be assumed that (in the same way as in poliomyelitis) in bacillary dysentery, for example, there will in due course be a vaccine that will protect those who are exposed to the disease. Success is reported in the use of an inactivated vaccine against mumps, and a live attenuated mumps vaccine has been tried out in the USSR. Perhaps it will not be long before the very recalcitrant staphylococcal infections, which have resisted all efforts at control through immunological methods for the past 75 years, will yield to the energetic attempts now being made to find a vaccine. The success that has attended poliomyelitis vaccination cannot fail to stimulate efforts elsewhere.

The new WHO publication sets out the present position of immunization in the control of communicable disease and is based largely on papers read and technical discussions held at the Thirteenth World Health Assembly. The volume contains the opening address of the chairman of the technical discussions, the report drafted at the end of the discussions, two of the papers prepared as background material for the guidance of the participants, and a further paper written expressly for this new publication. Many aspects of immunization are covered—the basic principles on which immunization rests, the immune response and the duration of immunity, the case for immunization, the organization of immunization programmes, the preparation of satisfactory vaccines, controlled trials of vaccines,

[4] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **169**, 26.

compulsion or non-compulsion in vaccination, the specific diseases in which immunization plays a part and the extent to which it does so, the risks of and contra-indications to immunization, etc.

* * *

The following immunization schedules were accepted by the participants in the technical discussions at the Thirteenth World Health Assembly as being suitable for areas with adequate and areas with inadequate medical services, respectively.

FOR AREAS WITH ADEQUATE MEDICAL SERVICES

Age	Proposed schedule
2-6 months	Diphtheria-pertussis-tetanus triple vaccine: 3 doses with 1 month's interval between each dose.
6-7 months	Smallpox vaccination.
7-10 months	Poliomyelitis vaccine (inactivated): 2 doses with 1 month's interval.
15-18 months	Booster dose of triple vaccine; simultaneously, third dose of poliomyelitis vaccine.
2-4 years	Fourth dose of poliomyelitis vaccine.
5-6 years	Booster dose of diphtheria-tetanus vaccine; simultaneously, smallpox revaccination.
10-15 years	Booster dose of diphtheria-tetanus vaccine if Schick test positive; no injection of diphtheria prophylactic in Schick pseudo-reactors. BCG vaccination (in tuberculin-negative reactors).

FOR AREAS WITH INADEQUATE MEDICAL SERVICES

Age	Proposed schedule	Visit
0-4 weeks	(1) BCG vaccination.	1st
3-9 months	(2) Smallpox vaccination.	2nd and 3rd
	(3) Diphtheria-pertussis-tetanus (triple vaccine with alum): 2 doses at an interval of one month. The first injection could be given at the time of smallpox vaccination. Smallpox vaccination is verified at the second visit. Failures of smallpox vaccination are revaccinated.	
School entry or soon thereafter	(4) Diphtheria/tetanus booster (plain or with alum).	4th and 5th
	(5) TAB vaccination (where necessary): 2 doses at an interval of one month.	
	(6) Smallpox revaccination: at the time of second TAB injection.	
10-14 years	(7) BCG revaccination (in tuberculin-negative reactors).	6th and 7th
	(8) Smallpox revaccination.	
	(9) TAB booster.	

COMPULSORY OR VOLUNTARY VACCINATION*

Although a century and a half have elapsed since vaccination was introduced by Jenner, it does not yet seem to have been universally accepted. It is easy enough to understand why isolated peoples, living as their ancestors have for generations and being as yet untouched by modern civilization, fail to grasp the reason for vaccination and are hostile to it. It is less easy to understand why civilized people, even doctors themselves, should still form anti-vaccination leagues.

Just how strong is this hostility to vaccination ? In the USA, when the campaign to have the susceptible population immunized with Salk vaccine against poliomyelitis had been in progress for some months, it was decided that the response was inadequate. A survey was therefore carried out in 1957 to ascertain why more people had not offered themselves for vaccination.[1] The inquiry showed that people were on the whole well informed about vaccination, and not specifically opposed to it. However, there were no direct, positive influences acting upon them to make them go and have themselves vaccinated. Thus, many adults did not undergo vaccination simply because they kept on putting it off. Some also had the feeling that they were not susceptible to the disease—a feeling that was related to the belief that victory over poliomyelitis had been achieved—and many parents of teenagers thought that their children were less susceptible to the disease than younger children. Those with more education and higher economic and social standards were more aware of the need met by the vaccine and the threat presented by poliomyelitis, and were accordingly more likely to have themselves immunized. The doctor's influence was of prime importance. Many people said that they would have had themselves vaccinated if their doctors had recommended it; but they then admitted that they seldom visited their doctors.

A separate survey in California in 1956[2] elicited some additional information about the attitude of the public to vaccination against poliomyelitis. Families that had not had their children vaccinated against other diseases tended not to have them vaccinated against poliomyelitis, and usually belonged to a lower social and economic level. The attitude of other families in their immediate circle exercised a great influence. Of the 11% of mothers who were unfavourable to vaccination, most mentioned fear, their disapproval of all injections, or the opposition of someone else, as the reason for their attitude. Among mothers who were favourable to vaccination but who had not had their children vaccinated, the chief reason for this omission was simple negligence. A point that confused a certain number of people was that in the early stages of the campaign vaccination had been limited to children aged 5-9, the reason being simply a shortage of vaccine. Later on, when the vaccine became more plentiful, many people did not realize that other age groups might avail themselves of vaccination and were, in fact, being urged to do so.

It may be surmised that some of the opposition to vaccination is based on the feeling that animals are made to suffer in order to provide vaccine; it is thus allied to the opposition to vivisection. Some may be due to the fear engendered by the headline reporting of accidents or serious side reactions, always more sensational than news about the tens of thousands of people who have been vaccinated safely. Some may be due to fear of the vaccination procedure itself, of the pain of the needle and the later pain at the site. In some people an obstinate refusal to conform will make them hostile to any general measure, even one benefiting them, particularly if it is compulsory. More important than

* Based on: Moerloose, J. de (1961) *Compulsory or voluntary vaccination.* In: World Health Organization, *The role of immunization in communicable disease control*, Geneva, p. 85 (*Public Health Papers*, No. 8).

[1] Glasser, M. A. (1958) *Amer. J. publ. Hlth*, 48, 141.

[2] Merrill, M. H. (1958) *Amer. J. publ. Hlth*, 48, 146.

genuine opposition are apathy, indifference, procrastination, the feeling that the disease, whatever it is, may affect other people but not oneself. Among more abstract reasons adduced against vaccination, especially compulsory vaccination, are the individual's right to his own personal freedom and the right to religious freedom—compulsory immunization being considered by members of certain sects as contrary to their beliefs.

In favour of compulsory vaccination it is argued that if a vaccine against a disease threatening the community is effective, anyone who does not have himself vaccinated is committing an offence against the community. He is thus abusing his right to individual freedom by endangering other people, and he should be compelled to undergo vaccination so that the community may be protected. This argument is applied to all members of the community, whether they have religious scruples about vaccination, or are too apathetic to have themselves vaccinated, or exhibit a "doltish prejudice" against vaccination. It follows that if a vaccination campaign runs the risk of failure because not enough people have had themselves vaccinated to ensure a level of immunity high enough for control of the disease concerned, compulsion should be employed.

Does compulsion achieve all it is supposed to achieve? If the experience of the United Kingdom with smallpox vaccination is to be regarded as typical, it seems not. Smallpox vaccination was made compulsory in that country in 1853. In 1897 and 1907 the inclusion of a conscientious objection clause led to a progressive decline in the number of vaccinations, and in the years 1940 to 1949—a period during which several other countries were intensifying vaccination—the average annual percentage of children under 1 year vaccinated in the United Kingdom did not exceed 35%. Compulsion was abolished in 1948, and in the age group under 1 year the percentage of vaccinations then fell to less than 20%. Since 1951, however, intensive health education in favour of vaccination has led to a rise in the number of vaccinations in this age group—in 1958 it reached 44.5% in England and Wales.

Smallpox vaccination in the United Kingdom is perhaps not a very good example to choose as an illustration of the defects of compulsion. In the United Kingdom and in most of Europe, smallpox is now not endemic, the occasional outbreaks being the result of infection imported from outside, especially from the main reservoir of the disease in South-East Asia. These outbreaks can be controlled by strict quarantine of contacts and vaccination of all concerned with the patients. Consequently, the question whether compulsory vaccination for the whole population is necessary when isolated outbreaks are the only possible or likely manifestations of the disease had been exercising the minds of the medical profession in the United Kingdom for some considerable time before compulsion was abolished. Moreover, infant vaccination alone, even when done successfully, will not protect the whole population or control the spread of smallpox in the community. To maintain a high level of immunity in the population, revaccination at suitable intervals is essential, and there was much controversy about whether the amount of vaccination required could be justified. Some of these arguments had become reasonably well known to the general public. It can hardly be doubted that they had their effect in swelling the numbers of those who claimed the benefit of the conscientious objection clause or succeeded in one way or another in evading vaccination for their children. They must also have led to diminished zeal on the part of the medical authorities in seeing that vaccination was enforced.

The situation with regard to vaccination against diphtheria in England and Wales provides an interesting comparison with that of smallpox vaccination. Vaccination against diphtheria has never been compulsory, and in the decade before large-scale immunization —i.e., 1933-42—the annual average of cases was 55 125, of deaths 2783. A campaign was launched in 1941 to educate the public to the desirability of having children vaccinated against this disease, with the result that the number of vaccinations soared and the number of cases and deaths fell rapidly. In 1956 there were 53 cases, with 3 deaths; in 1957,

37 cases, with 4 deaths; and in 1958, 80 cases, with 8 deaths. Although diphtheria morbidity rises and falls and there have been sharp falls in the incidence in some countries since the epidemic of 1943-45, " the close correlation between the initiation and widespread application of active immunization and the steady fall of both morbidity and mortality rates can leave no doubt about the effectiveness of vaccination " [3]—and, it may be added, of the health education drive in favour of diphtheria vaccination in England and Wales.

The various groups taking part in the Technical Discussions at the Thirteenth World Health Assembly came to the conclusion that there is no simple solution to the controversial problem of whether vaccination should be compulsory or voluntary.

" The decision whether to adopt compulsory or voluntary vaccination ", says the report of these discussions,[4] " has to be made according to experience of or opinion about which would result in the most effective vaccination programme, and these vary greatly in different countries. However, the consensus in all groups was that the ultimate aim should be voluntary vaccination, depending for its success on the development of a spontaneous demand by the population for vaccination through health education both of the population at large and—especially important in some countries—of the medical profession itself, which should, but often does not, play a leading role in stimulating a proper attitude to immunization."

While voluntary vaccination is the ideal, it is obviously an ideal that cannot be attained overnight.

" The aim that vaccination programmes should become 'the people's programme with government participation' rather than 'the government's programme with people's participation' can only be achieved by gradual stages . . . In the words of one group of participants: 'In under-developed areas compulsory vaccination is essential. As education improves so compulsion can be relaxed. However, it is stressed that for the success of all programmes it is essential to inform the populations with great care *how*, *when*, and *where* the programmes are to take place and explain *why* as the ability of the population to understand such explanations improves. Health education should be undertaken in all programmes, whether compulsory or not.' "

[3] Cruickshank, R. (1961) *The background to immunization.* In: World Health Organization, *The role of immunization in communicable disease control*, Geneva, p. 33 (*Public Health Papers* No. 8).

[4] World Health Organization (1961) *The role of immunization in communicable disease control*, Geneva, p. 101 (*Public Health Papers* No. 8).

Hookworm and shoes

" Insistence upon wearing shoes as a protective measure against hookworm infection is unrealistic. Shoes of such quality as would provide protection are beyond the means of those who need them for that purpose. There is essentially no hookworm transmission except in wet situations and expensive shoes are almost certain to be removed to avoid damage to the shoes and the discomfort of wet feet in them. The barefoot habit has such firm practical basis and is so strongly preferred in all situations which favour hookworm transmission that it is unrealistic and to some extent cruel (to children at least) to urge the purchase and habitual use of shoes."

From Beaver, P.C. (1961) *Control of soil-transmitted helminths*, World Health Organization, Geneva (*Public Health Papers* No. 10)

WHO/UNICEF BCG VACCINATION PROGRAMME, 1951-60

Since 1951 WHO and UNICEF have helped countries and territories in three continents in carrying out mass BCG vaccination campaigns. A characteristic feature of this world-wide programme is the uniformity of the methods and products employed. A standard low-dose intradermal tuberculin test [1] is used to select persons for vaccination; non-reactors to this test are vaccinated intradermally with liquid BCG vaccine provided by different WHO-approved production laboratories. Similarly, standard procedures are used in the collection and tabulation of data on the tuberculin testing and BCG vaccination. Statistical reports of the work performed up to the end of 1953, 1954, 1956 and 1958, respectively, have already been published.[2] The present report brings the results forward to the end of 1960.

By the end of 1960 approximately 309 million persons had been tuberculin-tested and 117 million vaccinated in the entire programme covering 41 countries and territories with a combined population of over 800 million. A steady increase in the annual number of tests and vaccinations took place until 1955, in which year 44 million tests and 17 million vaccinations were given. The number decreased in the following two years and increased again slightly in 1958 to 37 million tests and 14 million vaccinations. The level was maintained in 1959 and 1960 (see figure).

The 41 countries where WHO/UNICEF campaigns are being, or have been, conducted are listed in Table 1, with breakdown of results by continent and country. In the campaigns in the 21 Asian countries approximately 292 million persons have been tested. This represents 94% of the over-all total, the Indian campaign alone accounting for 50%, the campaign in Pakistan for 11%, and the other 19 campaigns for 33%. The comparatively small contribution—13 million tests—of the 16 campaigns in America is due to their having been conducted in small and thinly populated areas. The one exception is the Colombian campaign, which accounts for about 36% of the total number of persons tested on the American continent.

A substantial proportion of those tested failed to return for the reading of the tuberculin test; on an average 18% were lost to the programme in this way. The loss varies from 3% to 12% in America, from 3% to 26% in Asia, and from 24 % to 35% in Africa. On the other hand nearly all persons found tuberculin negative have been vaccinated, the percentage for the entire programme being nearly 99.

The age distribution of persons tested (with test read) and vaccinated in the countries where the campaigns have been completed is shown in Table 2. In several countries, especially in America, more than half the tested persons belong to the age group 15 years and over. In others, chiefly in Asia, the age group 7-14 years predominates. The vaccinated population is on the average younger than the tested as the proportion of persons eligible for vaccination among the tested decreases with age; in nearly all the campaigns the majority of those vaccinated are in the age group 7-14 years.

To estimate the extent of participation in the campaigns the coverage of persons 0-14 years has been computed for completed campaigns in instances where sufficiently detailed population figures are available (Table 1). In 15 out of the 25 countries for which the coverage has been computed, less than half the children under 15 years were reached by the campaign; in 10 countries the campaign covered less than a third of this group. In 4 small countries, all in America, the coverage was as high as 75% or more.

[1] The test uses PPD Tuberculin, batch RD 23 with Tween, from the Statens Seruminstitut, Copenhagen; up to the middle of 1958 an earlier batch (RT 22) was used.

[2] *Bull. Wld Hlth Org.*, 1955, **12**, 301; *Chron. Wld Hlth Org.*, 1956, **10**, 126; 1957, **11**, 140; *Off. Rec. Wld Hlth Org.*, 1959, **96**, 38.

NUMBER IN MILLIONS

HALF-YEARLY TOTALS OF PERSONS TESTED AND VACCINATED
IN THE WHO/UNICEF-ASSISTED BCG VACCINATION PROGRAMME, 1951-60

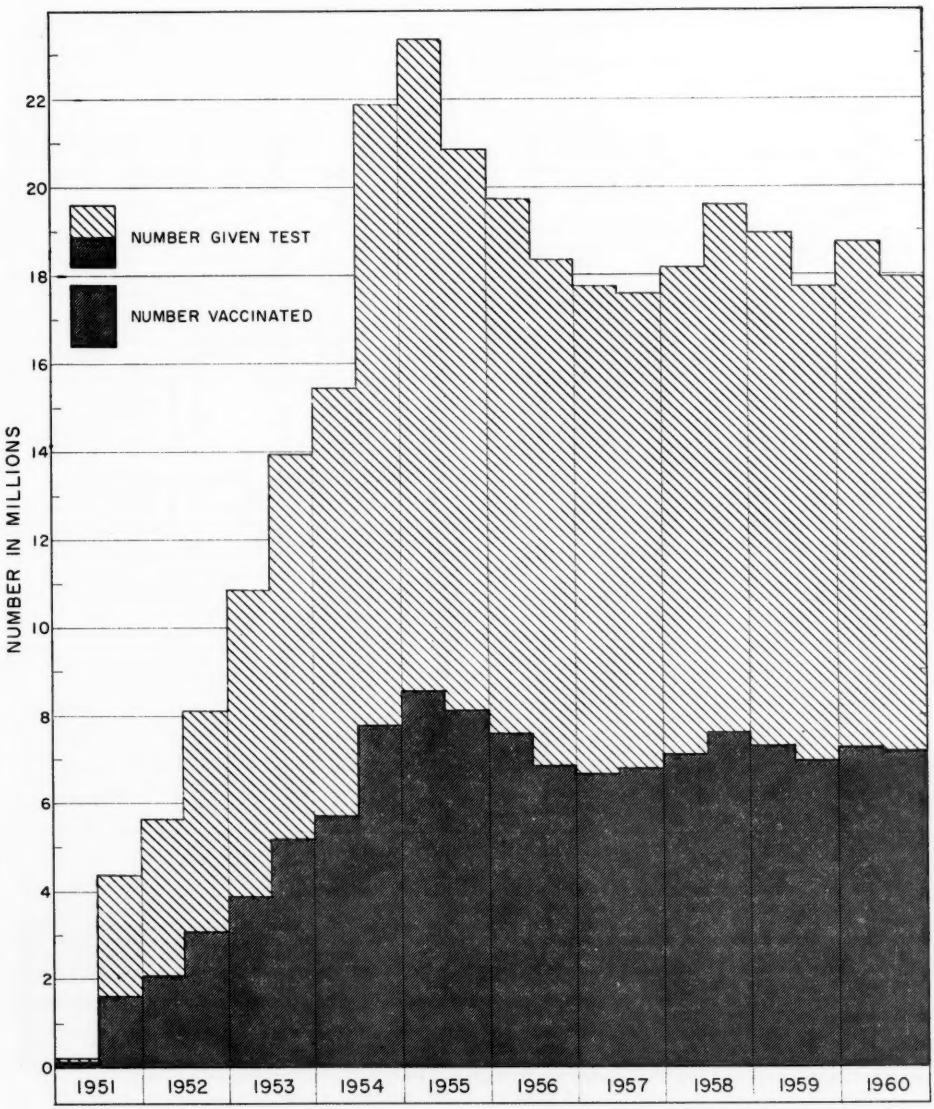


TABLE 1. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, COVERAGE OF AGE GROUP 0-14 YEARS FOR COMPLETED CAMPAIGNS, AND PERCENTAGE POSITIVE IN AGE GROUP 7-14 YEARS, BY CONTINENT AND COUNTRY, 1951-60

Continent and country	Campaign period	Number of persons [a] (in thousands)				Coverage [c] of age group 0-14 years (%)	Percentage [d] positive in age group 7-14 years
		given test	with test read		vaccinated [b]		
			total	negative			
All countries		309 319	254 627	118 585	116 983		
Africa		3 883	2 674	1 332	1 321		
Egypt [e]	July 1951-Dec. 1952	2 269	1 476	654	649	18 [f]	33 [f]
Ethiopia and Eritrea	May 1953-Dec. 1955	609	461	295	294	4	29
Libya	Feb. 1953-Dec. 1955	318	236	133	133	34	37
Sudan	Dec. 1956-May 1960	687*	501*	250*	245*	20	38
America		13 105	12 169	7 580	7 598		
Barbados	Jan. 1956-March 1957	87	78	41	41	57	32
British Guiana	March 1954-July 1955	208	192	111	111	65	35
British Honduras	Sept. 1953-April 1954	49	46	23	23	75	30
Chile	Feb. 1956-March 1958	1 031	960	503	502	23	31
Colombia	Sept. 1954-Dec. 1956	4 752	4 414	2 770	2 767	41	22
Costa Rica	March 1952-July 1954	263	248	198	195	44	13
Dominican Republic	Dec. 1958-	1 418	1 328	1 010	1 026	.	19
El Salvador	Aug. 1951-Nov. 1952	349	312	183	179	21	24
Guatemala	July 1956-July 1958	2 287	2 121	1 234	1 251	62	19
Honduras	May 1957-Dec. 1958	804	758	454	455	49	24
Jamaica	Oct. 1951-July 1953	635	586	349	348	52	18
Leeward Islands: St Kitts	Nov. 1953-Jan. 1954	24	23	9	9	83	.
Paraguay	Aug. 1954-Dec. 1955	692	629	387	384	54	32
Surinam	Dec. 1955-Aug. 1956	108	95	56	55	..	30
Trinidad and Tobago	April 1952-May 1954	338	321	212	212	78	24
Windward Islands	Jan. 1954-April 1954	60	58	40	40	78	16
Asia		292 331	239 784	109 673	108 064		
Aden Colony	Feb. 1952-May 1952 Jan. 1956-March 1956	38	28	11	11	..	53
Brunei	Sept. 1952-Dec. 1953	33	28	10	10	60	48
Burma	Dec. 1951-	7 876**	6 552**	2 745**	2 718**	.	47
Cambodia	Feb. 1956-Dec. 1958	1 236	1 146	573	567	41	45
Ceylon [e]	May 1954-	3 696	3 079	1 547	1 493	.	37
China (Taiwan)	May 1951-	8 423	7 646	4 871	4 843	.	41
Hong Kong	April 1952-April 1955	379	326	86	99	24	77
India [e]	July 1951-	154 733	125 444	55 493	54 443	.	..
Indonesia	Nov. 1952-	24 566	18 309	7 462	7 394	.	44
Iran	May 1952-	7 531	6 189	4 342	4 260	.	22
Iraq	Aug. 1952-June 1955	657	545	238	234	21	48
Jordan	Dec. 1953-Dec. 1955	624	553	320	318	..	..
Malaya	Jan. 1951-Dec. 1953	659	617	328	359	22	43
Netherlands New Guinea	May 1956-May 1959	121	117	64	64	..	27
Pakistan [e]	July 1951-	34 943	27 818	13 781	13 513	.	32
Philippines	Sept. 1951-	10 645	9 251	4 728	4 786	.	49
Sarawak	July 1952-Dec. 1953	155	129	57	59	28	45
Singapore	June 1951-Dec. 1953	95	90	36	37	18	61
Thailand	Nov. 1951-	11 646	9 522	4 000	3 996	.	38
Turkey	Jan. 1953-	23 360	21 585	8 693	8 576	.	34
Viet Nam	April 1954-Dec. 1957	915	810	288	284	..	59

. Not applicable

.. Data not available

[a] The figures may in some instances include persons retested and revaccinated.

[b] The figures include some persons vaccinated without previous test.

[c] Coverage is defined as the number of tests read in the age group 0-14 years as a percentage of the general population in the same age group. The general population 0-14 years of age is estimated by raising the population figures for this age group at the latest census by the percentage increase of the total population from the census to the mid-year nearest to the mid-point of the campaign. The data are obtained primarily from the United Nations *Demographic Yearbook*. Coverage is given only for completed campaigns.

[d] Data on retesting of persons have been excluded from the material for the purpose of calculating the percentages of positives.

[e] Before July 1951 the following work was carried out by the International Tuberculosis Campaign: Egypt: 2 104 311 tests given, 661 128 vaccinations; Ceylon: 306 707 tests given, 122 764 vaccinations; India: 4 129 570 tests given, 1 372 029 vaccinations; Pakistan: 923 342 tests given, 294 598 vaccinations. In Ceylon, furthermore, 827 516 persons were tested and 418 851 vaccinated under government auspices between July 1951 and May 1954.

[f] Based on results from the total campaign, including the ITC programme.

* Including survey April 1954-April 1955.

** Totals up to 31 August 1960.

TABLE 2. PERCENTAGES OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, BY AGE, IN CAMPAIGNS COMPLETED DURING 1951-60

Continent and country	Percentage [a]					
	with test read			vaccinated [b]		
	Age 0-6	Age 7-14	Age 15 and over	Age 0-6	Age 7-14	Age 15 and over
All three continents	19.8	35.9	44.3	31.0	41.4	27.6
Africa	21.7	30.9	47.4	35.2	39.5	25.3
Egypt	22.1	29.6	48.3	38.8	41.1	20.1
Ethiopia and Eritrea	24.1	35.8	40.1	33.5	39.7	26.8
Libya	24.1	39.5	36.4	34.0	44.4	21.6
Sudan	17.4	25.9	56.7	28.7	32.4	38.9
America	20.1	30.5	49.4	30.3	38.1	31.6
Barbados	19.5	37.7	42.8	32.9	48.4	18.7
British Guiana	23.7	37.3	39.0	37.0	41.4	21.6
British Honduras	22.9	24.0	53.1	42.0	33.4	24.6
Chile	20.5	36.0	43.5	31.6	47.4	21.0
Colombia	19.5	31.0	49.5	28.5	38.8	32.7
Costa Rica	25.3	42.3	32.4	30.0	46.2	23.8
El Salvador [c]	14.5	40.7	44.8	21.4	51.7	26.9
Guatemala	19.1	23.0	57.9	30.9	30.0	39.1
Honduras	23.0	25.3	51.7	35.2	31.5	33.3
Jamaica	15.9	30.9	53.2	25.4	42.3	32.3
Leeward Islands	19.7	22.1	58.2	46.4	21.1	32.5
Paraguay	24.0	35.1	40.9	35.1	38.9	26.0
Surinam	22.9	35.3	41.8	36.0	42.1	21.9
Trinidad and Tobago	26.3	34.6	39.1	37.4	39.9	22.7
Windward Islands	21.6	25.5	52.9	30.4	31.3	38.3
Asia	17.7	52.9	29.4	30.2	54.0	15.8
Aden [c]	12.0	46.3	41.7	27.5	61.9	10.6
Brunei	20.2	23.4	56.4	47.8	32.1	20.1
Cambodia	23.8	49.2	27.0	34.9	49.5	15.6
Hong Kong	22.7	43.2	34.1	60.9	33.3	5.8
Iraq	10.5	56.2	33.3	19.2	66.5	14.3
Jordan	18.9	38.9	42.2	27.7	45.3	27.0
Malaya [c]	12.4	65.0	22.6	24.3	64.4	11.3
Netherlands New Guinea	21.6	21.4	57.0	36.4	28.2	35.4
Sarawak	19.5	29.9	50.6	36.6	36.3	27.1
Singapore [c]	13.1	64.3	22.6	37.2	53.7	9.1
Viet Nam	13.2	71.0	15.8	23.7	69.5	6.8

[a] The figures may in some instances include persons retested and revaccinated.
[b] The figures include some persons vaccinated without previous test.
[c] Based on totals less than those given in Table 1, because breakdowns by age were not given for some of the material.

TABLE 3. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, COVERAGE OF AGE GROUP 0-14 YEARS, AND PERCENTAGE POSITIVE IN AGE GROUP 7-14 YEARS, BY CIVIL DIVISION IN CAMPAIGNS COMPLETED DURING 1958-60 [a]

Country and division	Number of persons [b]				Coverage [d] of age group 0-14 years (%)	Percentage [e] positive in age group 7-14 years
	given test	with test read		vaccinated [c]		
		total	negative			
Africa						
Sudan	686 784	501 111	250 218	245 353	20 [f]	38
Provinces:						
Bahr el Ghazal	204 686	156 799	71 165	69 704	16	43
Blue Nile	7 845	7 203	3 893	3 887	.	37
Darfur	6 205	5 452	1 979	1 972	.	62
Equatoria	323 801	222 718	127 252	124 351	27	73
Kassala	7 181	6 591	3 148	3 144	.	41
Khartoum	8 318	7 297	4 469	4 408	.	27
Kordofan	7 354	6 446	2 454	2 447	.	59
Northern	6 779	6 149	4 160	4 155	.	22
Upper Nile	114 615	82 456	31 698	31 285	10	52
America						
Chile	1 031 549	959 755	502 860	501 663	23	31
Provinces:						
Aconcagua	14 537	13 673	7 285	7 254	14	32
Arauco	29 287	27 560	11 558	11 538	47	44
Bio-Bio	40 417	38 689	19 049	19 011	33	32
Cautín	115 589	109 908	58 544	58 473	36	29
Colchagua	56 594	53 870	29 237	29 179	48	28
Concepción	76 834	73 220	31 329	31 305	25	47
Coquimbo	78 336	72 552	39 601	39 479	37	32
Curicó	34 791	31 743	17 448	17 405	42	26
Linares	59 350	55 801	30 123	29 958	46	27
Llanquihue	42 695	35 608	16 152	16 100	31	43
Malleco	63 866	57 799	30 168	30 094	47	27
Maule	17 472	16 407	8 843	8 826	32	30
Nuble	54 337	51 861	28 938	28 876	27	24
O'Higgins	71 209	68 223	36 439	36 411	39	27
Osorno	42 744	37 825	24 478	24 430	38	25
Santiago	29 994	26 501	10 658	10 612	2	47
Talca	54 557	48 973	30 916	30 859	33	21
Valdivia	98 546	92 170	49 082	49 013	49	29
Valparaíso	50 394	47 372	23 012	22 840	13	34
Honduras	803 691	757 679	453 519	454 807 [g]	49	24
Provinces:						
Atlántida	51 744	48 210	21 636	21 636	66	40
Choluteca	73 670	71 270	50 371	50 361	62	17
Colón	10 358	9 162	4 514	4 514	25	37
Comayagua	46 692	44 698	29 188	29 185	61	20
Copán	68 931	66 019	47 692	47 684	60	15
Cortés	120 933	110 849	54 863	54 851	74	33
El Paraíso	58 122	56 137	39 603	39 592	62	18
Francisco Morazán*	161 295	150 504	75 364	75 343	64	22
Islas de la Bahía	1 790	1 656	888	886	19	31
Lempira	6 951	6 522	3 624	3 624	7	40
Olancho	37 184	35 551	25 390	25 387	43	19
Santa Bárbara	74 683	70 969	50 286	50 270	70	18
Valle	24 602	23 562	15 651	15 648	37	22
Yoro	66 736	62 570	34 449	34 445	58	30

* Including Departamento de Tegucigalpa.

TABLE 3 (concluded)

Country and division	Number of persons [b] given test	Number of persons [b] with test read total	Number of persons [b] with test read negative	Number of persons [b] vaccinated [c]	Coverage [d] of age group 0-14 years (%)	Percentage [e] positive in age group 7-14 years
Asia						
Cambodia	1 236 113	1 146 127	572 858	567 022	41	45
Provinces:						
Battambang	67 325	64 120	35 666	35 440	22	43
Kampott	92 784	88 656	37 998	37 629	66	52
Kandal*	340 496	321 518	157 232	155 801	38	46
Kompong-Cham	144 201	134 116	74 987	74 270	39	42
Kompong-Chnang	47 694	43 281	20 678	20 328	39	48
Kompong-Speu	45 493	35 961	16 359	16 182	31	55
Kompong-Thom	58 622	52 927	25 886	25 419	40	47
Kratie	17 899	15 220	10 311	10 181	31	29
Prey-Veng	72 974	67 905	38 024	37 558	30	42
Pursat	58 589	54 480	21 676	21 207	56	54
Siemreap	76 592	70 366	38 213	38 075	53	44
Stung Treng	3 111	2 553	1 368	1 340	8	38
Svay Rieng	104 029	98 724	50 979	50 339	68	41
Takeo	106 304	96 300	43 481	43 253	92	51
* Including the capital Phnom-Penh.						
Netherlands New Guinea	121 078	117 351	64 199	64 199	..	27
Districts:						
Biak	12 388	11 941	6 204	6 204	..	27
Demta	3 896	3 854	2 465	2 465	..	14
Fak-Fak	9 854	9 799	5 248	5 248	..	32
Hollandia	27 443	26 516	12 226	12 226	..	35
Japen	20 517	20 277	10 718	10 718	..	31
Kamtoeck Cressie	2 508	2 501	2 249	2 249	..	5
Kokonao	916	858	390	390	..	33
Manokwari	1 514	1 187	809	809	..	14
Meranke	5 395	4 931	3 176	3 176	..	26
Mimika	4 786	4 629	1 903	1 903	..	37
Nimboran	2 636	2 629	1 723	1 723	..	16
Radja Empat	1 038	1 038	426	426	..	17
Sarmi	3 145	3 067	1 697	1 697	..	20
Seroei	2 740	2 729	1 762	1 762	..	17
Sorong	12 478	12 203	7 195	7 195	..	17
Tanah Merah	277	277	131	131	..	29
Teminaboean	3 190	3 083	2 132	2 132	..	16
Wandamen	2 482	2 390	1 064	1 064	..	17
Waris	2 791	2 358	2 069	2 069	..	3
District unspecified	1 084	1 084	612	612	..	32

. Not applicable

.. Data not available

[a] Four campaigns were completed in 1958. Full details on one of them (Guatemala) and provisional data on another (Chile) have already been published (*Off. Rec. Wld Hlth Org.*, 1959, **96**). Detailed statistics on the campaigns in Cambodia and Honduras and final data on Chile were not available at that time and are therefore given here.

[b] The figures may in some instances include persons retested and revaccinated.

[c] The figures include some persons vaccinated without previous test.

[d] The population 0-14 years is estimated for subdivisions by applying the age distribution for the entire country to the population figures for each subdivision at the latest census and raising the resulting estimates by the percentage increase of the total population from the census to the mid-year nearest to the mid-point of the campaign.

[e] Data on retesting of persons have been excluded from the material for the purpose of calculating the percentages of positives.

[f] Applies to only three provinces, the other provinces being covered by tuberculin survey only.

[g] Including 1381 newborns for whom no province of vaccination is specified.

TABLE 4. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, BY AGE, IN CAMPAIGNS COMPLETED DURING 1958-60 [a]

Continent and country	Number of persons [b]							
	with test read			Total	vaccinated [c]			Total
	Age groups (years)				Age groups (years)			
	0-6	7-14	15 and over		0-6	7-14	15 and over	
Africa								
Sudan	87 142	129 766	284 203	501 111	70 396	79 572	95 385	245 353
America								
Chile	196 373	346 030	417 352	959 755	158 306	237 984	105 373	501 663
Honduras	174 534	191 668	391 477	757 679	160 139	143 067	151 601	454 807
Asia								
Cambodia	272 336	564 348	309 443	1 146 127	197 853	280 767	88 402	567 022
Netherlands New Guinea	25 156	24 996	66 587	116 739 [d]	23 260	17 973	22 608	63 841 [d]

[a] Four campaigns were completed in 1958. Full details on one of them (Guatemala) and provisional data on another (Chile) have been published previously (*Off. Rec. Wld Hlth Org.*, 1959, **96**). Detailed statistics on the campaigns in Cambodia and Honduras and final data on Chile were not available at that time and are therefore given here.

[b] The figures may in some instances include persons retested and revaccinated.

[c] The figures include persons vaccinated without previous test.

[d] Totals less than those given in Table I, because breakdowns by age were not given for some of the material.

The results of the pre-vaccination tuberculin test, although primarily used to select persons for vaccination, also provide some indication of the prevalence of tuberculous infection. In the present report the percentage of tuberculin positives found among those with test read in the age group 7-14 years has been used as an index of the prevalence of tuberculous infection; the 7-14 year age group has been selected because it is the one generally best represented in the campaigns. As seen in Table 1, the frequency of positive reactors is lowest in America, ranging from 13% to 35%, and highest in Asia, where it exceeds 30% in all but 2 countries and 40% in 13 out of 19 countries. Caution should be exercised in drawing conclusions from these percentages, however, as in many countries, particularly in the tropics, the efficiency of the tuberculin test in distinguishing between positive and negative reactors is seriously reduced because of the existence of non-specific low-grade tuberculin sensitivity. The largest non-specific reactions will in general be classified as " positive " and the percentage of positives may thus represent an overestimate of the frequency of tuberculous infection.

By the end of 1960, 11 campaigns were in operation, 10 in Asia and 1 in America. For all but two of the campaigns completed before 1959 detailed statistics have been given in previous reports.[3] The two exceptions were the campaigns in Cambodia and Honduras, for which data were not available when the last report was published. Breakdowns are given in Table 3 by administrative division, and in Table 4 by age, for these two campaigns and for those completed in 1959-60; the present statistics also include data for the campaign in Chile, as those previously reported [4] were only provisional.

[3] The International Tuberculosis Campaign (1953) *Mass BCG vaccination in Egypt 1949-52 with special reference to statistics on BCG vaccination and pre- and post-vaccination allergy*, Copenhagen; *Bull. Wld Hlth Org.*, 1954, **10**, 113; 1955, **12**, 301; *Chron. Wld Hlth Org.*, 1956, **10**, 126; 1957, **11**, 140; *Off. Rec. Wld Hlth Org.*, 1959, **96**, 38.

[4] *Off. Rec. Wld. Hlth Org.*, 1959, **96**, 38.

Notes and News

Executive Board: twenty-eighth session

The Executive Board of WHO met in Geneva for its twenty-eighth session from 29 May to 1 June 1961, under the chairmanship of Dr A. O. Abu-Shamma. The Vice-Chairmen were Dr A. Martínez-Marchetti and Dr K. Suvarnakich; Dr A. Nabulsi and Dr S. Sigurdsson were Rapporteurs. The Board heard reports on, *inter alia*, the latest developments in the WHO programme of assistance to the Republic of the Congo (Leopoldville) (see below), and WHO help to newly independent States.

More than $3 million are still needed for the successful prosecution of the worldwide malaria eradication programme in 1962, and the Board appealed for further voluntary contributions for this purpose. Over twenty countries have formally notified the Organization of their decision to issue postage stamps devoted to the programme on or about 7 April (World Health Day) 1962 (see page 311), and other countries have announced their partial participation in this project or their intention of issuing the stamps on another date.

It was decided that the Fifteenth World Health Assembly will be held in the Palais des Nations, Geneva, and that—subject to consultation with the Secretary General of the United Nations—it will start on 8 May 1962. "Education and training of the physician for the preventive and social aspects of clinical practice" was selected as the subject of the technical discussions to be held at this Assembly, and Sir Samuel Manuwa, of the Federation of Nigeria, was invited to serve as Chairman of the discussions.

The next session of the Board will be held in the Palais des Nations, Geneva, starting on 15 January 1962.

Assistance to the Congo (Leopoldville)

The latest developments in the WHO programme of assistance to the Republic of the Congo (Leopoldville) were reported to the Executive Board in May by Dr M. G. Candau, Director-General of WHO. Initially, emergency medical teams, provided by the Red Cross and some governments, had helped to tide over the immediate crisis. As time went on, however, it became clear that WHO would have to continue the systematic recruitment of medical personnel to ensure the continuation of essential health services. Of the total number of 130 doctors required, 118 have been recruited, 90 of whom are now in the Congo working side by side with 35 others provided by the International Committee of the Red Cross and the League of Red Cross Societies. The assistance of the two Red Cross bodies may soon have to come to a close, but it is of course hoped that the Red Cross doctors will stay on as long as possible. Dr Candau considered that a further health staff of 90-100 will be needed almost immediately; their recruitment is, however, subject to the availability of United Nations funds for the purpose. The WHO medical staff enjoy a certain measure of mobility, thanks to the generosity of UNICEF, which has provided them with 35 jeep station wagons.

To help the Government to organize and run its health department, WHO has assigned an advisory team to each provincial health ministry (an advisory team is already working at the Central Ministry of Health in Leopoldville). In addition, various WHO short-term consultants have visited the country to advise on specific problems, such as budgetary questions, the

organization of the pharmaceutical depot, leprosy, etc.

While it must be recognized that there are serious deficiencies in the structure and functioning of the health services, it can nevertheless be claimed that, despite a rather difficult and unusual situation, there is now a skeleton staff rendering very useful and, in some cases, life-saving services to the country. The number of doctors in the country on 31 December 1959 was 761; on 31 May 1961 it was 454.

There are at present 5 WHO visiting professors at the Medical School of the University of Lovanium, near Leopoldville, teaching respectively pathology, anaesthesiology, bacteriology, radiology, and ear, nose and throat diseases. Arrangements are being made to send another 5 professors and 4 nursing tutors. A grant has been made for the training of 25 medical graduates, and it is proposed to subsidize the training of 30 more during the next academic year.

Sixty-one "*assistants médicaux*" from the Congo are now studying for their medical degrees in France. Offers have been received from several European countries for the training of more of these assistants, starting with the next academic year. It is hoped in this way to provide medical training for a further 30 students.

Fellowships have been given to 7 Congolese undergraduates for medical studies in France and Switzerland. Offers of similar training have been received from several other countries, and it is intended to award 10 more fellowships for this purpose during the next academic year. A number of other fellowships for Congolese students, including fellowships in health studies, have been provided through the intermediary of the United Nations. Certain countries, including Belgium and the USSR, have received a large number of Congolese students under other schemes.

Steps have also been taken to award 20 fellowships to selected Congolese "*infirmiers diplômés*" (qualified male nurses) for specialized training as laboratory technicians, entomologists and hospital administrators.

An emergency situation occurred in South Kasai, where a large number of refugees, estimated at between 100 000 and 150 000, were left destitute during the tribal warfare in the province in the first three months after independence. Lack of food led to near famine conditions, and hundreds of children and even adults were suffering from more or less severe kwashiorkor. A shortage of medical supplies and of trained personnel made it extremely difficult to give adequate care to the severely ill, even after food supplies started to arrive and a regular distribution of the most needed foods, such as milk powder (supplied by UNICEF), canned or dried fish, maize, meal, rice, and palm oil, was assured. Four WHO specialists from Headquarters and the Regional Office for Africa were detailed to the area to deal with the situation.

WHO intervention changed the picture dramatically. Centres of treatment were established to deal with the rising incidence of kwashiorkor, and emergency hospital tents increased the number of beds available for patients. As increased food supplies began to provide calorie and protein requirements, the kwashiorkor epidemic was largely brought under control. Measures were also taken to ensure systematic vaccination against smallpox and to provide detected tuberculosis cases with medical care. Continuous vigilance is being maintained for the next few months to forestall potential outbreaks of disease and food shortages. In the meantime, the Food and Agriculture Organization of the United Nations (FAO) is helping, by the instruction of auxiliary personnel and Junior Red Cross staff, and of Congolese women who will teach mothers in village hospitals and dispensaries.

In a resolution, the Executive Board expressed the hope "that the resources made available to the United Nations for civil operations in the Congo will make it possible to increase the strength of health personnel", and reiterated its thanks to the International Committee of the Red Cross and the League of Red Cross Societies, as well as to the governments that have contributed to the WHO programme in the Congo.

Endemic treponematoses in the Sudan

It was pointed out in 1957 that, with some 25 million cases of yaws and several areas of endemic syphilis, Africa was the largest reservoir of endemic treponematoses in the world. A WHO-assisted survey of these diseases in the

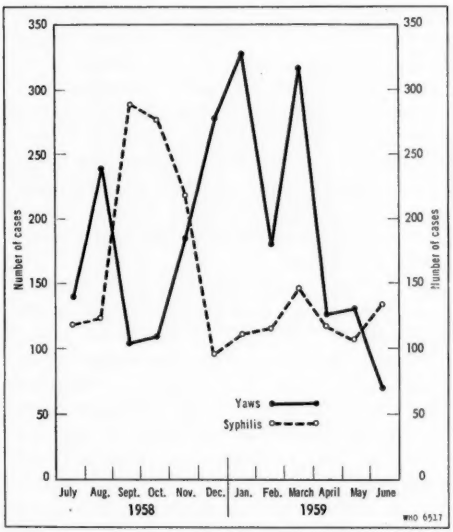
Sudan—one of the countries where they present a particularly serious problem—was carried out in 1959 at the request of the Government, and its findings were reviewed in a recent number of the WHO Bulletin.[1]

The parts of the Sudan most affected by yaws or endemic syphilis—often by both—are the Provinces of Equatoria, Bahr el Ghazal, the Upper Nile and Darfur, the northern part of Kassala Province and the Nuba Mountains in Kordofan Province. Some areas, such as the Torit district in Equatoria Province, are active foci of yaws in the "wild" expanding stage of infection. The high proportion of active clinical manifestations of yaws found among children—43.1% of clinical cases diagnosed among children, or 95.6% of all early cases—is a classical feature of endemic non-venereal treponematosis. The prevalence of active clinical yaws was 54% in three villages that were systematically examined. Conditions appear to be similar in the rural areas of Bahr el Ghazal and Upper Nile Provinces.

It is sometimes difficult to distinguish the lesions of yaws from those of endemic syphilis. Mucous lesions in treponemal infections occur only in regions where syphilis exists and not in those where only yaws is prevalent. The Sudan is an ideal place for studying the relationship between the two, this relationship being of particular interest in those parts of the country where yaws is in regression. In the region of the Nuba Mountains, it is possible to observe the transitional stage at which infection with *Treponema pallidum* replaces infection with *T. pertenue*. The figure shows the incidence of clinical cases of yaws and endemic syphilis among outpatients at rural dispensaries in Bor District from July 1958 to June 1959. Yaws there is now reduced to such an extent that recent lesions are exceptional. On the other hand, syphilitic infections are frequent and are spreading among the rural population in the endemic, non-venereal form. A transitional stage between venereal and non-venereal syphilis may also be observed; non-venereal endemic syphilis has spread from imported venereal syphilis, aided by the generally poor living conditions of the population. Several typical foci of endemic syphilis are also in regression.

[1] Grin, E. I. (1961) *Bull. Wld Hlth Org.*, **24**, 229.

MONTHLY INCIDENCE OF YAWS AND ENDEMIC SYPHILIS AMONG OUT-PATIENTS AT RURAL DISPENSARIES IN BOR DISTRICT, UPPER NILE PROVINCE, SUDAN, JULY 1958-JUNE 1959



The author concludes that, owing to the prevalence of the treponematoses in the regions mentioned above, the proposed national control programme in the Sudan would have to cover some 5 million people in an area of 1.5 million km². About 20% of the population of the endemic regions suffer from one or other of the two treponemal infections in the active clinical stage. The most satisfactory method of control might well be mass treatment of the whole population, which is very effective in areas of high prevalence where a large part of the population is at risk.

Tuberculosis: risk to family contacts

In 1956 the Tuberculosis Chemotherapy Centre in Madras began a controlled study to determine whether the chemotherapy of tuberculosis in India when carried out at home would be

as effective as in a sanatorium. The initial period of treatment lasted a year and the results indicated that domiciliary treatment appeared to give as good results as sanatorium treatment when patients at home received effectively supervised chemotherapy.[1] The question arose, however, whether there might not be a greater risk of infection among the close family contacts of the patients treated at home, and a concurrent study was made of the fate of contacts during this first year.[2] This revealed that the major risk to contacts lies in exposure to the infectious case before diagnosis and that the incidence of tuberculosis among the contacts of patients treated at home is no higher than among contacts of patients treated in hospital.

This contact survey has now been extended over the whole two-year period dating from the beginning of treatment of the index cases.[3] During the second year the index cases were all being treated at home, those with persistent active disease continuing with chemotherapy; and chemotherapy was also given to half the quiescent cases as part of a study dealing with prophylaxis against relapse. The main comparison lay between 256 contacts of 75 patients treated at home and 274 contacts of 73 patients initially treated in the sanatorium, all in families where the index cases had been the only infectious members and had been allotted at random for their year of home or sanatorium treatment. The two groups of contacts were similar in composition and were followed equally carefully by radiography, bacteriological examinations and tuberculin testing. In the first year there had been 9 tuberculosis cases (3.5%) in home contacts as against 18 (6.6%) in sanatorium contacts. The present study shows that, in the second year, 3 cases (1.9%) in home contacts and 4 (2.4%) in sanatorium contacts were added to these. Thus, the attack rate of tuberculosis in the contacts of patients treated at home from the outset was no greater than in the contacts of patients segregated for their initial year, and it seems that the major risk to contacts had already been incurred from exposure to the index cases before diagnosis was first made. The latter conclusion is supported by the fact that 18 (53%) of all contact cases were detected during the first three months of the trial, including all the 6 cases in initially tuberculin-negative sanatorium contacts who had been immediately segregated from their corresponding index cases.

Two major points emerge from this study. First, as far as a two-year follow-up is capable of showing (the survey is planned to cover a five-year period in all), there appears to be no special risk to close family contacts associated with the decision to treat tuberculosis patients at home, provided the chemotherapy is effective. Second, there is a good case for investigating the prophylactic treatment of young close family contacts, since 20 of the 27 persons that developed tuberculosis during the first year and 3 of the 7 cases in the second year were contacts under 7 years of age.

Administration of the International Sanitary Regulations

In administering the International Sanitary Regulations, WHO has so far used the services of three quarantine units situated in Washington, D.C. (for the Region of the Americas), Alexandria (for the Eastern Mediterranean Region), and Singapore (for the South-East Asia and Western Pacific Regions). The responsibilities entrusted to these three quarantine units are now being transferred to WHO Headquarters in Geneva by stages, starting on 1 July 1961, the transfer to be completed by the end of this year. States will continue to send the notifications required under Articles 3-7 and 9 of the Regulations to the appropriate quarantine unit in Alexandria, Singapore or Washington until 31 December 1961, while other notifications and questions or complaints will be addressed to WHO Headquarters in Geneva beginning 1 July 1961. On and after 1 January 1962 all notifications, etc. should be sent directly to WHO Headquarters.

This decision to centralize the administration of the Regulations has been taken because of the drastic changes in several aspects of international quarantine operations over the past ten years.

[1] *Bull. Wld Hlth Org.*, 1959, 21, 51.
[2] *Bull. Wld Hlth Org.*, 1960, 23, 463.
[3] *Bull. Wld Hlth Org.*, 1961, 24, 129.

These changes include technical advances in communications (e.g., in the use of short-wave radio), the increase in air travel and the greater rapidity of international flights, and the decline and even elimination of quarantinable diseases in many parts of the world. Epidemiological intelligence on quarantinable diseases needs to be collected and disseminated by the most rapid means to all continents. A considerable body of recommended practices to be followed in implementing the provisions of the International Sanitary Regulations has grown up, and the number of complaints under the Regulations has diminished.

Malaria eradication stamps

The first postage stamps were issued in Great Britain in 1840 as an accounting procedure to show that carriage had been paid; and this remains their prime function. Since then, however, stamps have increasingly been used also as a means of commemorating events and drawing attention to national and international activities. The first commemorative postage stamp was probably that issued in 1888 by New South Wales for the hundredth anniversary of the founding of the colony, and the first health propaganda stamps were the Christmas seals issued in Denmark in 1903 in aid of antituberculosis work.

To stimulate interest in the battle against malaria, all Member States of WHO were recently invited to arrange a simultaneous issue of postage stamps on 7 April (World Health Day) 1962 to draw attention to the world-wide malaria eradication campaign.

While publicity for the campaign is the main purpose of the issue, it is also expected to create philatelic interest. It is therefore hoped that Member States will either donate a certain number of stamps to be sold on the philatelic market to benefit WHO funds for malaria eradication, or use a percentage of the proceeds from their general sale for the same purpose. Countries engaged in national eradication programmes might also consider ways of obtaining funds for their programmes from the stamp issue.

Two designs have been suggested and are illustrated here. Member States will of course be free to adopt other designs if they wish, but it is hoped that these will include the common emblem and the inscription " The World United Against Malaria ".

SUGGESTED DESIGNS FOR MALARIA ERADICATION STAMPS

Training of health workers from emerging countries

In 1960, 112 fellowships were awarded by WHO to health workers from emerging countries in Africa, in addition to the 67 fellowships under the special programme for the Congo (Leopold-

ville). For 1961, 116 fellowships are provided for, of which 23 were awarded by 15 April 1961, while a further 30 are under negotiation. For 1962, 134 fellowships are provided for under the regular budget and the Expanded Programme of Technical Assistance. The fellowships for the Congo will continue over several years. WHO-assisted training courses for medical, auxiliary and nursing personnel are under way in some 20 newly independent States in Africa and Asia. Assistance is also given to a number of medical and nursing schools in the form of advice and provision of teaching staff on a long-term basis. In order to accelerate training programmes in emerging countries, a special survey has been undertaken of the most urgent needs in this field. WHO is also co-operating with the United Nations and its other specialized agencies in joint education and training programmes for these countries.

People and Places

Second Report on the World Health Situation

Sir John Charles has been invited to act as special consultant to WHO in the preparation of the *Second Report on the World Health Situation*, which will cover the years 1957-1960 inclusive. While Member States have been asked to send their reports by 31 July 1961, some of the statistical data for 1960 may not be available until the end of September. The preparation of the report is expected to begin in mid-September, when Sir John will start his three-month assignment in Geneva.

Sir John Charles, who was President of the Twelfth World Health Assembly in 1959 and Chairman of the WHO Executive Board at its twentieth and twenty-first sessions (1957-1958), recently retired from the post of Chief Medical Officer of Health, Ministry of Health, London. Before his appointment to this post in 1950, he was Chief Medical Officer of Health for the City and County Borough of Newcastle-upon-Tyne.

Maternal and child health in Uganda

Dr Helen M. Wallace, Chief, Child Health Studies Branch, Division of Research, US Children's Bureau, Washington, D.C., has been appointed for a period of three months to advise the Government of Uganda on the type of organization of maternal and child health services best suited to the needs and resources of the country.

Dr Wallace was educated at Columbia University College of Physicians and Surgeons and at the Harvard School of Public Health. From 1943 to 1955, she was Chief of the Maternity and Newborn Division and Director of the Bureau for Handicapped Children in the New York City Department of Health. She served as Professor of Maternal and Child Health at the University of Minnesota School of Public Health from 1956 to 1959. Before taking up her duties as Chief of the Child Health Studies Branch in October 1960, Dr Wallace was Chief of Professional Training, US Children's Bureau, with responsibility for training programmes for all categories of professional maternal and child health personnel.

New Senior Malaria Adviser for the Western Pacific

Dr M. Postiglione has been appointed WHO Senior Malaria Adviser for the Western Pacific Region, in charge of the Regional Malaria Unit. In this capacity, he is responsible for the supervision of WHO-assisted malaria projects in the Region and the co-ordination of the efforts of governments and international agencies in their joint campaign against malaria.

Dr Postiglione was born in Naples, Italy, and obtained his degree in medicine and surgery at the University of Naples and his diploma in tropical medicine and hygiene at the University of Liverpool. He has also specialized in malariology at the Parasitology Laboratory of the Istituto Superiore di Sanità, Rome. He joined WHO in 1951 as team leader in a malaria demonstration project in Cambodia, later serving as senior WHO officer in a malaria control demonstration project in Burma and as project leader in a

malaria eradication programme in Syria. Before his present appointment, he served for three years in the Division of Malaria Eradication, WHO Headquarters, Geneva.

Hookworm in West Africa

A WHO survey team, consisting of Dr Norman R. Stoll, Rockefeller Institute, New York, and Professor H. C. Hsieh, Kaohsiung Medical School, China (Taiwan), was recently set up to examine the problem of intestinal parasites in West Africa with special reference to hookworm.

A graduate of the School of Public Health, Johns Hopkins University, Baltimore, Md., USA, Dr Stoll has taken part in investigations on the control of hookworm in Puerto Rico, Central America, and China. Since 1927 he has been on the faculty of the Rockefeller Institute, first at the Princeton Laboratory and then, since 1950, in New York.

Dr Hsieh graduated in medicine at the College of Medicine, National Taiwan University, and has a diploma in tropical medicine and hygiene from the London School of Hygiene and Tropical Medicine. He has been associated with a Rockefeller Foundation study on malaria epidemiology in China (Taiwan) and with the subsequent WHO-assisted malaria control and eradication programmes. Since 1958, he has been leader of a pilot study on the control of hookworm and other parasites, under the Joint Commission on Rural Reconstruction in China (Taiwan).

Diagnosis of bilharziasis

Dr Elvio H. Sadun, Chief, Department of Medical Zoology, Walter Reed Army Institute of Research, Washington, D.C., has been appointed short-term consultant to the WHO programme for the sero-immunological diagnosis of bilharziasis. Dr Sadun has spent two years in Thailand as adviser to the Ministry of Health, and two years in Japan directing research in bilharziasis. He served as a WHO adviser for a short period in 1960.

Control of zoonoses in Ceylon

Dr Donald J. Dean, Assistant Director in Charge, Laboratories for Veterinary Science and Meat Hygiene, Division of Laboratories and Research, New York State Department of Health, Albany, N.Y., USA, has been appointed short-term WHO consultant to the Government of Ceylon. He will advise the Government on the control of the zoonoses, especially rabies. Dr Dean has previously served with WHO as adviser in the Regional Office for the Eastern Mediterranean, and as consultant in Africa and South America.

Headquarters appointment

Mr Carlo R. Fedele, of Switzerland, has been appointed Chief, External Relations, WHO Headquarters, Geneva, replacing Mr P. Bertrand who left the Organization in October 1960.

Born in Bellinzona, Canton of Ticino, Mr Fedele obtained a Doctorate in Law from Berne University in 1942. From 1943 to 1945, he worked in the Information and Press Service of the Federal Political Department, Berne. In 1946, he became first Attaché and later Secretary of the Swiss Legation in Bogota, Colombia, and from 1949 to 1950 he was Acting Chargé d'Affaires for Switzerland in Venezuela, and Panama.

On returning to Switzerland, he became Chief, Department of International Organizations, Federal Political Department, Berne, and attended several international meetings as a member of the Swiss Delegation. In 1953, he joined the Intergovernmental Committee for European Migration (ICEM) and was appointed Deputy Chief of the Committee's Mission in Brazil. In 1956, he became Chief, Latin American Section, ICEM Headquarters, Geneva, a post which he held until his appointment with WHO.

International Non-Proprietary Names for Pharmaceutical Preparations

In accordance with paragraph 3 of the Procedure for the Selection of Recommended International Non-Proprietary Names for Pharmaceutical Preparations,[1] notice is hereby given that the following names are under consideration by the World Health Organization as Proposed International Non-Proprietary Names.

Comments on, or formal objections to, the proposed names may be forwarded by any person to the Pharmaceutical unit of the World Health Organization within four months from 1 August 1961.

The inclusion of a name in the lists of proposed international non-proprietary names does not imply any recommendation for the use of the substance in medicine or pharmacy.

PROPOSED INTERNATIONAL NON-PROPRIETARY NAMES (*Prop. I.N.N.*): LIST 11[2]

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
acetophenazinum acetophenazine	2-acetyl-10-{3-[4-(β-hydroxyethyl)piperazin-1-yl]propyl}phenothiazine
acidum xenazoicum xenazoic acid	*p*-(α-ethoxy-*p*-phenylphenacylamino)benzoic acid
acidum xenyhexenicum xenyhexenic acid	2-(4-biphenylyl)hex-4-enoic acid
amitriptylinum amitriptyline	5-(3-dimethylaminopropylidene)dibenzo[*a*, *d*]-cycloheptа-1,4-diene
amphotalidum amphotalide	*N*-(5-*p*-aminophenoxypentyl)phthalimide
aspartocinum aspartocin	an antibiotic substance obtained from cultures of *Streptomyces griseus* var. *spiralis* or the same substance produced by any other means
bamethanum bamethan	2-*n*-butylamino-1-*p*-hydroxyphenylethanol
bendroflumethiazidum bendroflumethiazide	3-benzyl-3,4-dihydro-7-sulfamoyl-6-trifluoromethylbenzo-1,2,4-thiadiazine 1,1-dioxide
benziodaronum benziodarone	2-ethyl-3-(4-hydroxy-3,5-diiodobenzoyl)benzofuran
benzphetaminum benzphetamine	*N*-benzyl-*N*,α-dimethylphenethylamine
bephenii hydroxynaphthoas bephenium hydroxynaphthoate	benzyldimethyl(2-phenoxyethyl)ammonium 3-hydroxy-2-naphthoate

[1] See Annex 1, page 318.

[2] Other lists of proposed international non-proprietary names can be found in *Chron. Wld Hlth Org.*, 1953, 7, 299; 1954, 8, 216, 313; 1956, 10, 28; 1957, 11, 231; 1958, 12, 102; *WHO Chronicle*, 1959, 13, 105, 152; 1960, 14, 168, 244. Lists of recommended international non-proprietary names were published in *Chron. Wld Hlth Org.*, 1955, 9, 185; *WHO Chronicle*, 1959, 13, 106.

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
betamethasonum betamethasone	9α-fluoro-11β ,17α, 21-trihydroxy-16β-methylpregna-1,4-diene-3,20-dione
carbenzidum carbenzide	ethyl 2-(α-methylbenzyl)-1-hydrazinecarboxylate
carperidinum carperidine	ethyl 1-(2-carbamoylethyl)-4-phenylpiperidine-4-carboxylate
cetohexazinum cetohexazine	2,3-dihydro-4,6-dimethylpyridazin-3-one
chlordiazepoxidum chlordiazepoxide	7-chloro-2-methylamino-5-phenyl-*3H*-1,4-benzodiazepine 4-oxide
chlormidazolum chlormidazole	1-*p*-chlorobenzyl-2-methylbenzimidazole
chloroserpidinum chloroserpidine	10-chloro-11-demethoxyreserpine
chlorphenterminum chlorphentermine	*p*-chloro-α,α-dimethylphenethylamine
cinnarizinum cinnarizine	1-*trans*-cinnamyl-4-diphenylmethylpiperazine
clonitazenum clonitazene	2-(*p*-chlorobenzyl)-1-(2-diethylaminoethyl)-5-nitrobenzimidazole
cloquinatum cloquinate	chloroquine di(8-hydroxy-7-iodoquinoline-5-sulfonate)
crotoniazidum crotoniazide	2-(2-butenylidene)-1-isonicotinoylhydrazide
detrothyroninum detrothyronine	D-3,5-diiodo-4-(3-iodo-4-hydroxyphenoxy)phenylalanine
dexpanthenolum dexpanthenol	D-(+)-α,γ-dihydroxy-*N*-(3-hydroxypropyl)-β,β-dimethylbutyramide
diisoprominum diisopromine	3,3-diphenylpropyldiisopropylamine
dimeflinum dimefline	8-dimethylaminomethyl-7-methoxy-3-methyl-2-phenylbenzo-γ-pyrone
disulfamidum disulfamide	5-chlorotoluene-2,4-disulfonamide
ethambutolum ethambutol	*N,N'*-bis(1-hydroxymethylpropyl)ethylenediamine
ethosuximidum ethosuximide	3-ethyl-3-methylpyrrolidine-2,5-dione
etonitazenum etonitazene	2-(*p*-ethoxybenzyl)-1-(2-diethylaminoethyl)-5-nitrobenzimidazole
fluocinoloni acetonidum fluocinolone acetonide	6α,9α-difluoro-11β,21-dihydroxy-16α,17α-isopropylidenedioxypregna-1,4-diene-3,20-dione
guanethidinum guanethidine	*N*-(2-perhydroazocin-1'-ylethyl)guanidine
haloprogesteronum haloprogesterone	17α-bromo-6α-fluoropregn-4-ene-3,20-dione

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
hydromorphinolum hydromorphinol	14-hydroxy-7,8-dihydromorphine
hydroxocobalaminum hydroxocobalamin	α-(5,6-dimethylbenzimidazolyl)hydroxocobamide
iminophenimidum iminophenimide	3-ethyl-3-phenylpiperazine-2,6-dione
isoaminilum* isoaminile	4-dimethylamino-2-isopropyl-2-phenylvaleronitrile
isocarboxazidum isocarboxazid	3-*N*-benzylhydrazinocarbonyl-5-methylisoxazole
isosorbidi dinitras isosorbide dinitrate	1,4,3,6-dianhydrosorbitol 2,5-dinitrate
mepivacainum mepivacaine	(±)-1,2′,6′-trimethylpipecolanilide
metaxalonum metaxalone	5-(3,5-xylyloxymethyl)oxazolidin-2-one
methastyridonum methastyridone	2,2-dimethyl-5-styryloxazolidin-4-one
methiomeprazinum methiomeprazine	(±)-10-(3-dimethylamino-2-methylpropyl)-2-methylthiophenothiazine
methoserpidinum methoserpidine	11-demethoxy-10-methoxyreserpine
methoxyfluranum methoxyflurane	2,2-dichloro-1,1-difluoro-1-methoxyethane
methyclothiazidum methyclothiazide	6-chloro-3-chloromethyl-3,4-dihydro-2-methyl-7-sulfamoyl-1,2,4-benzothiadiazine 1,1-dioxide
methysergidum methysergide	*N*-[1-(hydroxymethyl)propyl]-4-methyl-(+)-lysergamide
metronidazolum metronidazole	1-(2-hydroxyethyl)-2-methyl-5-nitroimidazole
naphthononum naphthonone	2-(2-hydroxynaphth-1-yl)cyclohexanone
natrii iopodas sodium iopodate	sodium β-(3-dimethylaminomethyleneamino-2,4,6-triiodophenyl) propionate
nealbarbitalum nealbarbital	5-allyl-5-neopentylbarbituric acid
nifuroximum nifuroxime	5-nitro-2-furaldehyde oxime
nitrofurantoinum nitrofurantoin	1-(5-nitro-2-furfurylideneamino)hydantoin
oxymetholonum oxymetholone	17-hydroxy-2-hydroxymethylene-17α-methylandrostan-3-one
phebutazinum phebutazine	1,4-di(2-phenylbutyryloxyethyl)piperazine
phencyclidinum phencyclidine	1-(1-phenylcyclohexyl)piperidine

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
phendimetrazinum phendimetrazine	(+)-3,4-dimethyl-2-phenylmorpholine
phenethicillinum phenethicillin	(α-phenoxyethyl)penicillin
pheniprazinum pheniprazine	*N*,α-methylphenethylhydrazine
phenoperidinum phenoperidine	ethyl 1-(3-hydroxy-3-phenylpropyl)-4-phenylpiperidine-4-carboxylate
phenprocoumonum phenprocoumon	4-hydroxy-3-(1-phenylpropyl)2*H*-chromen-2-one
phenterminum phentermine	α,α-dimethylphenethylamine
piperacetazinum piperacetazine	2-acetyl-10-{3-[4-(β-hydroxyethyl)piperidino]propyl}phenothiazine
piperylonum piperylone	4-ethyl-1-(1-methylpiperid-4-yl)-3-phenylpyrazol-5-one
piprocurarii iodidum piprocurarium iodide	2-(2-diethylaminoethoxy)ethyl α-phenyl-α-piperidinoacetate dimethiodide
prampinum prampine	*O*-propionylatropine
pseudoephedrinum pseudoephedrine	(+)-2-methylamino-1-phenylpropan-1-ol
pyrophendanum pyrophendane	1-(1-methylpyrrolidin-3-ylmethyl)-3-phenylindane
pyroxaminum pyroxamine	3-(*p*-chlorodiphenylmethoxy)-1-methylpyrrolidine
quinethazonum quinethazone	7-chloro-2-ethyl-1,2,3,4-tetrahydro-6-sulfamoylquinazolin-4-one
rolitetracyclinum rolitetracycline	*N*-(pyrrolidin-1-ylmethyl)tetracycline
rotoxamini tartras rotoxamine tartrate	(+)-{(—)-2-[p-chloro-α-(2-dimethylaminoethoxy)benzyl]pyridine D-tartrate}
salazosulfadimidinum salazosulfadimidine	4′-(4,6-dimethylpyrimid-2-ylsulfamoyl)-4-hydroxyazobenzene-3-carboxylic acid
spironolactonum spironolactone	3-(7α-acetylthio-17β-hydroxy-3-oxo-4-androsten-17α-yl) propionic acid γ-lactone
sulfamonomethoxinum sulfamonomethoxine	N^1-(6-methoxypyrimidin-4-yl)sulfanilamide
tetrabenazinum tetrabenazine	1,2,3,4,6,7-hexahydro-3-isobutyl-9,10-dimethoxy-2-oxo-11b*H*-benzo[*a*]quinolizine
thiethylperazinum thiethylperazine	2-ethylthio-10-[3-(4-methylpiperazin-1-yl)propyl]phenothiazine
thiofuradenum thiofuradene	1-(5-nitrofurfurylideneamino)imidazolidine-2-thione
thiramum thiram	di(dimethylaminothiocarbamoyl)disulfide

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
tranylcyprominum tranylcypromine	(±)-*trans*-2-phenylcyclopropylamine
trichlormethiazidum trichlormethiazide	6-chloro-3-dichloromethyl-3,4-dihydro-7-sulfamoylbenzo-1,2,4-thiadiazine 1,1-dioxide
trichlormethinum trichlormethine	tri(2-chloroethyl)amine
trimecainum trimecaine	*N*-(α-diethylaminoacetyl)-2,4,6-trimethylaniline
trimethoprimum trimethoprim	2,4-diamino-5-(3,4,5-trimethoxybenzyl)pyrimidine
triparanolum triparanol	2-*p*-chlorophenyl-1-[*p*-(2-diethylaminoethoxy)phenyl]-1-*p*-tolylethanol
tropenzilini bromidum tropenziline bromide	*O*-benziloyl-7-methoxy-*N*-methyltropinium bromide
tropicamidum tropicamide	*N*-ethyl-*N*-pyrid-4-yl-methyltropamide
valnoctamidum valnoctamide	2-ethyl-3-methylvaleramide
xenthioratum xenthiorate	2-diethylaminoethyl 2-(4-biphenylyl)thiolobutyrate
xenygloxalum xenygloxal	biphenylenebisglyoxal

Annex 1

PROCEDURE FOR THE SELECTION OF RECOMMENDED INTERNATIONAL NON-PROPRIETARY NAMES FOR PHARMACEUTICAL PREPARATIONS *

The following procedure shall be followed by the World Health Organization in the selection of recommended international non-proprietary names for pharmaceutical preparations, in accordance with the World Health Assembly resolution WHA3.11:

1. Proposals for recommended international non-proprietary names shall be submitted to the World Health Organization on the form provided therefor.

2. Such proposals shall be submitted by the Director-General of the World Health Organization to the members of the Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations designated for this purpose, for consideration in accordance with the " General principles for guidance in devising International Non-proprietary Names ", appended to this procedure.[1] The name used by the person discovering or first developing and marketing a pharmaceutical preparation shall be accepted, unless there are compelling reasons to the contrary.

* Text adopted by the Executive Board in resolution EB15.R7 (*Off. Rec. Wld Hlth Org.*, 1955, 60, 3).

[1] See Annex 2, page 320.

3. Subsequent to the examination provided for in article 2, the Director-General of the World Health Organization shall give notice that a proposed international non-proprietary name is being considered.

A. Such notice shall be given by publication in *WHO Chronicle* and by letter to Member States and to national pharmacopoeia commissions or other bodies designated by Member States.

(i) Notice may also be sent to specific persons known to be concerned with a name under consideration.

B. Such notice shall:

(i) set forth the name under consideration;
(ii) identify the person who submitted a proposal for naming the substance, if so requested by such person;
(iii) identify the substance for which a name is being considered;
(iv) set forth the time within which comments and objections will be received and the person and place to whom they should be directed;
(v) state the authority under which the World Health Organization is acting and refer to these rules of procedure.

C. In forwarding the notice, the Director-General of the World Health Organization shall request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the proposed name during the period it is under consideration by the World Health Organization.

4. Comments on the proposed name may be forwarded by any person to the World Health Organization within four months of the date of publication, under article 3, of the name in *WHO Chronicle*.

5. A formal objection to a proposed name may be filed by any interested person within four months of the date of publication, under article 3, of the name in *WHO Chronicle*.

A. Such objection shall:

(i) identify the person objecting;
(ii) state his interest in the name;
(iii) set forth the reasons for his objection to the name proposed.

6. Where there is a formal objection under article 5, the World Health Organization may either reconsider the proposed name or use its good offices to attempt to obtain withdrawal of the objection. Without prejudice to the consideration by the World Health Organization of a substitute name or names, a name shall not be selected by the World Health Organization as a recommended international non-proprietary name while there exists a formal objection thereto filed under article 5 which has not been withdrawn.

7. Where no objection has been filed under article 5, or all objections previously filed have been withdrawn, the Director-General of the World Health Organization shall give notice in accordance with subsection A of article 3 that the name has been selected by the World Health Organization as a recommended international non-proprietary name.

8. In forwarding a recommended international non-proprietary name to Member States under article 7, the Director-General of the World Health Organization shall:

A. request that it be recognized as the non-proprietary name for the substance; and

B. request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the name, including prohibiting registration of the name as a trade-mark or trade-name.

Annex 2

GENERAL PRINCIPLES FOR GUIDANCE IN DEVISING INTERNATIONAL NON-PROPRIETARY NAMES

1. Names should, preferably, be free from any anatomical, physiological, pathological or therapeutic suggestion.

2. An attempt should first be made to form a name by the combination of syllables in such a way as to indicate the significant chemical groupings of the compound and/or its pharmacological classification. Preference should be given to the following syllables:

Latin	*English*	*French*	
inum	ine	ine	for alkaloids and organic bases
olum	ol	ol	for alcohols and phenols (-OH group)
alum	al	al	for aldehydes
onum	one	one	for ketones and other substances containing the CO group
enum	ene	ène	for unsaturated hydrocarbons
anum	ane	ane	for saturated hydrocarbons
cainum	caine	caïne	for local anaesthetics of the procaine type
mer	mer	mer	for mercurial compounds
sulfonum	sulfone	sulfone	for sulfone derivatives
quinum	quine	quine	for antimalarial substances containing a quinoline group
crinum	crine	crine	for antimalarial substances containing an acridine group
sulfa	sulfa	sulfa	for derivatives of sulfanilamide having an antibacterial action
dionum	dione	dione	for anti-epileptics derived from oxazolidinedione
toinum	toin	toïne	for anti-epileptics derived from hydantoin
stigminum	stigmine	stigmine	for anticholinesterases of the physostigmine (eserine) type.

3. Names should be distinctive in sound and spelling. They should not be inconveniently long and should not be liable to confusion with names already in use.

4. The addition of a terminal capital letter or number should be avoided as far as possible.

5. Names proposed by the person discovering or first developing and marketing a pharmaceutical preparation, or already officially adopted in any country, or used in national pharmacopoieas, or in works of reference such as " New and Non-official Drugs ", should receive preferential consideration.

6. Cognizance should be taken of the names of closely related substances and, where desirable, the name should show this relationship.

CORRIGENDUM

Vol. 15, No. 5-6

FOURTEENTH WORLD HEALTH ASSEMBLY—2

P. 168, right-hand column, lines 10-11

delete An antiyaws campaign
insert A campaign against pinta

GONORRHOEA

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